

1 1. In an optical device having at least one movable element, a method of
2 operating the optical device comprising the steps of:

3 receiving an optical signal from an optical input aperture;

4 diffracting the optical signal into one or more chromatically dispersed non-
5 zeroth-order components and a non-chromatically dispersed zeroth-
6 order component; and

7 directing one of the non-zeroth-order components to an optical output;

8 CHARACTERIZED IN THAT:

9 positional feedback information about the movable element is determined
10 from the zeroth-order optical signal.

1 2. The method according to claim 1 further comprising the step of:

2 directing the zeroth-order component to a position detector.

1 3. The method according to claim 2 further comprising the step of:

2 directing the optical signal to the movable element.

1 4. The method according to claim 3 wherein the optical-signal directing, the
2 zeroth-order-component directing, and the non-zeroth-order-component
3 directing is performed by a common optical element.

1 5. The method according to claim 4 wherein the common optical element is a
2 lens.

- 1 6. The method according to claim 1 wherein the diffracting step is performed by
- 2 the action of the movable element and that movable element is a diffraction
- 3 grating.
- 1 7. The method according to claim 1 further comprising the step of:
2 positioning the movable element based upon the positional feedback
3 information.
- 1 8. The method according to claim 1 wherein the movable element is a mirror.

- 1 9. The method according to claim 1 wherein the optical input aperture comprises
2 a plurality of input apertures.
- 1 10. The method according to claim 1 wherein the optical output comprises a
2 tapered slit.
- 1 11. The method according to claim 1 further comprising the step of:
2 chopping the non-zeroth order components such that desirable
3 signal/noise characteristics are realized.
- 1 12. An optical device comprising:
2 an input for receiving an optical signal;
3 a diffractor, for diffracting the optical signal into a one or more chromatically
4 dispersed non-zeroth-order components and a non-chromatically-
5 dispersed zeroth-order component;
6 a movable reflector, for selectively directing one of the non-zeroth order
7 components to an output; and

8 a position detector; responsive to the zeroth-order component; for providing
9 positional feedback information about the movable reflector.

1 13. The optical device according to claim 7 wherein the movable reflector is
2 responsive to control signals determined from the positional feedback
3 information.

1 14. The optical device according to claim 7 wherein the diffractor is a diffraction
2 grating.

1 15. The optical device according to claim 7 wherein the diffractor and the
2 movable reflector are the same optical element and that same optical element
3 comprises a grating.

1 16. The optical device according to claim 8 further comprising an optical element
2 for directing the input optical signal to the diffractor.

1 17. The optical device according to claim 8 further comprising an optical element
2 for directing the input optical signal to the diffractor and a non-zeroth-order
3 component to the output.

1 18. The optical device according to claim 12 further comprising an optical element
2 for directing the zeroth-order component to the position detector.

1 19. The optical device according to claim 13 wherein the input optical signal
2 director element, the non-zeroth-order directing element and the zeroth-order
3 directing element are a common optical element.

1 20. The optical device according to claim 14 wherein the common optical element
2 comprises a lens.

1 21. The optical device according to claim 12 wherein the input comprises one or
2 more apertures.

1 23. An optical device comprising:

2 means for inputting an optical signal;

3 means for diffracting the optical signal into one or more chromatically
4 dispersed non-zeroth-order components and a non-chromatically
5 dispersed zeroth-order component;

means for directing, one of the non-zeroth components to an output; and

7 means for determining, a position of the directing means from information
8 derived from the zeroth-order component.

1 24. The optical device according to claim 16 further comprising a means for
2 directing the zeroth-order component to the position determining means.

1 25. The optical device according to claim 17 wherein the zeroth-order component
2 directing means and the non-zeroth order directing means are lenses.

1 27. The optical device according to claim 23 further comprising:

2 means for chopping the output directed components.